

Name: _____

SCH4U – Winter 2018
Structure and Properties of Matter: Polymer Unit Project

Introduction

Polymers are large molecules that are made up of many repeating small molecules called monomers. They are found everywhere in daily life and have numerous applications. In this unit project, you will select a natural or synthetic polymer and report on its structure and properties.

Choosing your polymer

You may choose amongst the following polymers:

Natural	Synthetic
DNA	Polystyrene
RNA	Polyvinylchloride (PVC)
Cellulose	Kevlar
Hemoglobin	Nylon
Insulin	Polyethylene
Glycogen	Polyisoprene

Note that only 3 students can choose the same polymer for their projects. Sign-up for the polymer will be first-come-first-served. Once you have chosen your polymer, simply let me know at the beginning/end of class or send me an email at nicholas.desjardins@ocdsb.ca with the subject line “SCH4U – Polymer Project” for approval.

What are asked to do:

As part of your research, you will produce a handwritten report on your chosen polymer that touch on the following points:

- Identify the unit/monomer of the polymer:
 - Identify the atoms present in the unit/monomer.
 - Describe the intramolecular forces/bonding for the unit/monomer.
 - Explain the polarity of the unit/monomer.
- Illustrate the structure of the polymer:
 - Provide a small overview of how the polymer is formed.
 - Identify the application(s) of the polymer.
 - Explain how the intramolecular/intermolecular forces contribute to its application(s).
- Evaluate the applications of the polymer:
 - Assess its technological, environmental, and economic impacts.
 - Do safer, greener, more cost-effective alternatives exist? If so, what are they? If not, what other alternatives exist?

Submission Must Include:

- Handwritten report, pamphlet, comic strip (or other media, talk to me first)
- Annotated bibliography and in-text citations (APA format) of at *least* 3 reliable sources.

Due date

The project will need to be submitted by the end of the Structure and Properties of Matter Unit around mid-April (precise date to be determined).

Achievement Chart - Polymer Unit Project

Categories	50-59% Level 1	60-69% Level 2	70-79% Level 3	80-100% Level 4
Knowledge and Understanding				
	The student:			
Knowledge and understanding of the concepts (e.g., identifying the type(s) of intramolecular and intermolecular forces, identifying polarity, understanding of how the polymer is formed, understanding the role of polymers in society.)	demonstrates limited knowledge of the content and understanding of the concepts.	demonstrates some knowledge of the content and understanding of the concepts.	demonstrates considerable knowledge of the content and understanding of the concepts.	demonstrates thorough knowledge of the content and understanding of the concepts.
Thinking and Inquiry				
	The student:			
Critical/creative thinking processes, skills, and strategies (e.g., justifying the intramolecular and intermolecular forces at work and the role they play in the polymer's applications, justifying the polarity of the unit/monomer, provides evidence to support the impact of the polymer on society.)	uses critical/creative thinking processes, skills, and strategies with limited effectiveness.	uses critical/creative thinking processes, skills, and strategies with some effectiveness.	uses critical/creative thinking processes, skills, and strategies with considerable effectiveness.	uses critical/creative thinking processes, skills, and strategies with a high degree of effectiveness.
Annotated bibliography and proper APA formatting (e.g., APA format followed for in-text citation and referencing, provides at least 3 reliable sources [e.g., books, science journals].)	uses the correct APA format with many errors and includes a limited number reliable sources.	uses the correct APA format with some errors and includes some reliable sources.	Uses the correct APA format with few errors and includes a considerable number of reliable sources.	uses the correct APA format with no errors and includes a variety of reliable sources.
Communication				
	The student:			
Report clarity and organization (e.g., introduction and conclusion are present, all points are addressed, explanations are clear and complete, tables and figures are labelled, atoms are labelled in the polymer's structure.)	prepares a report with limited organization and clarity.	prepares a report with some organization and clarity.	prepares a report with considerable organization and clarity.	prepares a report with a high degree of organization and clarity.
Expression and organization of ideas and information (e.g., use of appropriate terminology and vocabulary, attention to spelling and grammar, sentences are well structured.)	expresses and organizes ideas and information with limited effectiveness.	expresses and organizes ideas and information with some effectiveness.	expresses and organizes ideas and information with considerable effectiveness.	expresses and organizes ideas and information with a high degree of effectiveness.
Application				
	The student:			
Connections between the polymer and its impact on technology, the environment, and economics (e.g., assessing the impact of the chosen polymer, assessing any possible alternatives to the polymer if they exist.)	makes limited connections between the polymer and its impact on technology, the environment, and economics.	makes some connections between the polymer and its impact on technology, the environment, and economics.	makes considerable connections between the polymer and its impact on technology, the environment, and economics.	makes a high degree of connections between the polymer and its impact on technology, the environment, and economics.